

25 September 1981

USSR REPORT  
TRANSPORTATION

No. 57

## CONTENTS

## AIR

Aviaexport's Achievements Detailed (SOVIET EXPORT, No 3, 1981) .....	1
Advertisement Details Yak-42's Capabilities (SOVIET EXPORT, No 3, 1981) .....	5

## MOTOR VEHICLE

Interview With Deputy Minister Kolomnikov (Valentin Kolomnikov Interview; MOSCOW NEWS, 9-16 Aug 81)	6
Kazakh Highways Minister on Motor Transport of Agricultural Products (Sh. Bekbulatov; KAZAKHSTANSKAYA PRAVDA, 17 Jul 81) .....	7

## RAILROAD

Interview With Deputy Minister of Railways Kulayav (Konstantin Kulayav Interview; MOSCOW NEWS, 16-23 Aug 81)	10
Causes of BAM Construction Delays Noted (V. Seseykin; GUDOK, 1 Jul 81) .....	11
Progress, Problems of Transcaucasian Rail Line (GUDOK, various dates) .....	13
Engineering Problems Overall Progress, by Ye. Khrakovskiy	
On Expanding Use of Cost Accounting Methodology (S. A. Nikulin; ZHELEZNODOROZHNIY TRANSPORT, Jun 81) ....	25

OCEAN AND RIVER

Progress, Problems in Transporting Grain (V. Yeliseyev; VODNYI TRANSPORT, 8 Aug 81) .....	33
--	----

MISCELLANEOUS

Aircraft Engines Used in Ground Transportation (VOZDUSHNIY TRANSPORT, 1 Aug 81) .....	36
--	----

## AVIAEXPORT'S ACHIEVEMENTS DETAILED

Moscow SOVIET EXPORT in English No 3, 1981 pp 10-11

**[Text]** Twenty years ago, in 1961, the export of planes, helicopters, and maintenance equipment, as well as their after-sales servicing were assigned to the AVIAEXPORT All-Union Export-Import Department which was transformed into an All-Union Association in 1964.

At present, airplanes and helicopters from the USSR are operated in dozens of countries. Thanks to their excellent specifications, reliability, economic performance, easy maintenance and operation, they have won the wide-scale acknowledgement of foreign customers. To date, over 4,000 Soviet aircraft have been delivered to 55 countries in Europe, Asia, Africa and America.

The organisations of socialist countries are our main partners-in-trade. Tu-154's fly the international routes of Balkan (Bulgaria), Malev (Hungary), Tarom (Romania) and Chosonminhang (DPRK). Il-62 and Il-62M intercontinental liners are serving the lines of Cubana de Aviación (Cuba), CSA (Czechoslovakia), interflug (GDR), LOT (Poland) and Tarom (Romania). Yak-40's are used in Bulgaria, Czechoslovakia, Hungary, Poland and Romania. The MIAT airline uses An-2 and An-24 planes for the ramified network of air routes in Mongolia. In 1978, we began exporting Il-76 and Il-76M transport planes.

Our foreign customers have purchased over 2,000 Mi-4, Mi-6, Mi-8 and Ka-26 helicopters. These reliable universal machines find ever widening application in various branches of the economy. Mi-8 helicopters, for instance, are successfully used on construction sites of Bulgaria,

Czechoslovakia and the GDR, especially in mountainous areas difficult to reach. In Peru, Mi-6's and Mi-8's are used for oil prospecting and to haul drilling equipment in the Upper Amazon area. Ka-26's give an excellent performance in agriculture. Hungarian agricultural organisations, for instance, have been widely using them since 1970.

A lot of aviation equipment has been delivered over the last few years to Angola, Kampuchea, Laos, Madagascar, Mozambique and Peru.

AVIAEXPORT maintains long-standing relations with Air Guinee (Guinea), Air Mali (Mali) and Bahtar (Afghanistan).

Besides airplanes, helicopters, aviation materials and spare parts, we also supply various airfield equipment, controlling and checking apparatus, ground and airborne radio equipment, parachutes and parachute systems, and we help our trade partners to organise proper servicing of their Soviet aircraft equipment. This assistance involves a variety of services, such as the pre-sales preparations of aviation equipment, demonstration flights, consultations, providing technical information, spare parts supplies, organisation of routine maintenance and repairs, sending experts to help out maintenance and repairs, training of flight and ground personnel, providing documentation and training aids.

When selling a new plane or helicopter model, AVIAEXPORT helps customers to retrain their air and ground personnel. This is done at Aeroflot's training establishments — the Academy, institutes, higher flying schools and technical schools of the USSR

civil aviation in accordance with curricula coordinated with the customers and taking into account both the ICAO standards and the trainees' actual level of knowledge and practical skills. After completing the training course at a Soviet school, the graduates receive international certificates giving them the right to operate or service aviation equipment. In 1980, some 4,000 foreigners were trained at Aeroflot's schools with AVIAEXPORT's assistance.

AVIAEXPORT attaches great importance to the timely supplies of spares to foreign clients. We annually export upwards of 100,000 different types of spare parts and units.

The basic element of our spare parts supply system is that of delivering them under annual orders that are placed by the customers for most of the parts that take much time to produce. These orders are filled during the year in question, and repairs using the spares received under them are normally done at the customers' facilities. The so-called service supplies are delivered within two months. There are also urgent and emergency (AOG) supplies: these are provided respectively within 7 days and 48 hours.

The annual deliveries of spare parts and units are effected under AVIAEXPORT's orders right from the factories, and all the other orders are filled by the central spare parts depot of the Aviazagranpostavka organisation. Over 100,000 different types of spare parts, units and materials can be stored at that facility on a floorspace of 20,200 sq.m.

Routine and scheduled maintenance and repairs of Soviet planes and helicopters are carried out by AVIAEXPORT both in the customer countries and, if the buyer so desires, at repair factories of the USSR Ministry of Civil Aviation.

The timely and comprehensive information on the latest developments of Soviet civil aviation engineering plays an important role in the promotion of our airplane and helicopter exports. AVIAEXPORT, jointly with the USSR Aviation Industry Ministry, has arranged hundreds of demonstration flights over dozens of European, Asian, African and Latin American countries. We are traditional participants in numerous international fairs

and exhibitions, and we often display the Soviet aviation industry's latest products at international air shows in Finland, the FRG, Italy, Japan and other countries.

Since 1965, the USSR Aviation Industry Ministry and AVIAEXPORT have regularly exhibited at the world's largest air show in Le Bourget, France. In 1979, for example, we displayed our Il-86 wide-body passenger plane, the Il-76 heavy transport, the Yak-42 short-haul liner, the Yak-50 aerobatic plane, the An-72 new medium-range jet transport for carrying up to 7.5 ton loads and the An-28 light multi-purpose short take-off and landing run aircraft. Our exhibits also included a Tu-154B passenger jet with the latest piloting and navigating complex jointly developed by Soviet and French engineers.

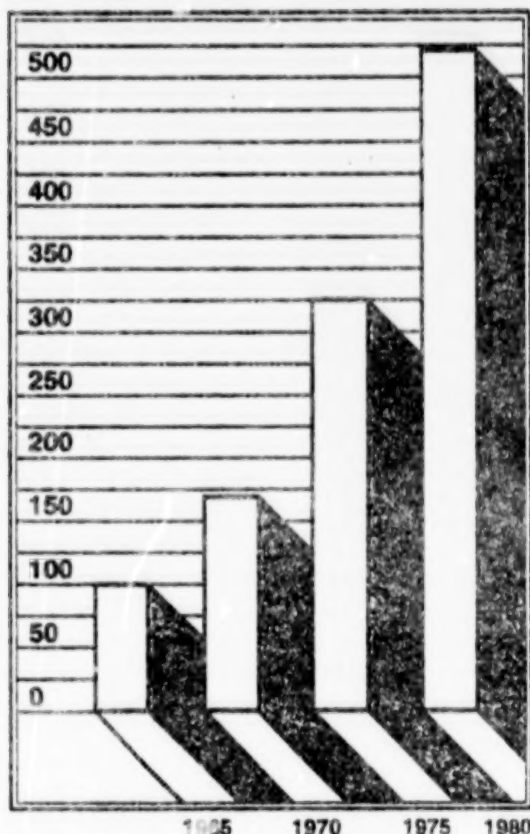
Our export range is being constantly revised and updated — in the near future we shall add the Il-86 and Yak-42 to the widely known Il-62, Il-76, Yak-40 and Tu-154 models.

An important aspect of AVIAEXPORT's activities is its participation, jointly with the Soviet aviation industry, in international programmes for specialised and joint production of aircraft.

In accordance with the Soviet-Polish agreement on co-operation in the production of the Il-86 wide-body plane, signed in 1977, the commercial aspects of this co-operation are handled by AVIAEXPORT and Pezetel, its Polish counterpart. The Il-86 is produced by the Voronezh aircraft works, and the stabilizer, fin, ailerons, flaps and other high-lift devices and engine pylons are made at Polish factories in Mielec, Swidnica and Kalisz. These factories had been producing An-2M light planes, Mi-2 helicopters and engines under Soviet licences for years, acquiring considerable experience in manufacturing sophisticated equipment. They have mastered the machining of titanium alloys, chemical treatment of aluminium, high-precision riveting operations and other advanced techniques necessary for the production of Il-86's components.

Similar co-operation is being developed with Czechoslovakia, Romania and other countries. Our activities in this field will continue to expand.

**V/O AVIAEXPORT:  
growth of exports, %**



In accordance with the Comprehensive Programme for Socialist Economic Co-operation, the CMEA countries are developing an automatic traffic control system. The Avia-D-Koren radar complex for controlling the airspace around an airfield, jointly created by Soviet and Polish engineers, is a major breakthrough in this field. This complex, consisting of the Avia-D primary radar of Polish design and the Koren secondary radar from the USSR, was delivered to Technocommerz (GDR) by AVIAEXPORT and Unitra (Poland). Aviation specialists in the GDR say that this system makes for higher flight regularity thus increasing the throughput capacity of Schönefeld Airport where they are used.

The integrated programme of AVIAEXPORT's activities makes it possible to meet our customers' widely varying demands. The experience of operating Soviet civil aviation equipment in many countries shows

that it gives reliable performance wherever used, which opens good prospects for the further growth of our exports. In 1980 they topped the 600 million rouble mark.

Our commercial successes would have been impossible without the country's tremendous scientific and industrial potential, without the achievements of the Soviet aircraft industry and civil aviation.

To bring the activities of export goods manufacturers still closer to our commercial practice and ensure a further improvement of the after-sales service of our equipment, AVIAEXPORT was transformed into an All-Union Self-Supporting Foreign Trade Association incorporating the following specialised firms: Samolet (heavy aircraft exports), Aerolet (medium-size aircraft exports), Vertolet (helicopter exports), Aviapribor (radio navigation equipment and instrumentation exports and imports), Aerodrommash (air-



field equipment exports and imports, co-operation in the production of aviation equipment with foreign firms and organisations in the production of aviation equipment), Aviatechservis (technical servicing of aviation equipment, urgent and emergency spare parts supplies, training foreign personnel in the USSR and sending Soviet experts to provide technical assistance and consultations abroad), Aeroremont (aviation equipment repairs in the USSR and delivering equipment for foreign repair facilities). All these firms are entitled to enter foreign trade transactions under the consent and on behalf of V/O AVIAEXPORT. The Board of V/O AVIAEXPORT includes representatives of the Ministry of the Aviation Industry, the Ministry of the Radio Industry, the Ministry of Civil Aviation and of certain manufacturing facilities under these ministries.

The new structure will enable us to tackle more effectively the problems we face in view of the ever growing export of Soviet aviation equipment.

CSO: 1812/79

AIR

ADVERTISEMENT DETAILS YAK-42'S CAPABILITIES

Moscow SOVIET EXPORT in English No 3, 1981 pp 12, 13

[Text]

The powerful high-lift devices and high power/weight ratio of the new passenger trijet endow it with magnificent take-off and landing characteristics: landing speeds of 210 kph and runway length of 1,800 m.

The Yak-42 is economical, with maximum fuel consumption of 33 g per passenger-km. The computerised piloting complex makes it possible to fly the plane over an optimal route and ensures automatic landing approach in accordance with ICAO Category II Standards.

The Yak-42 has the high rate of climb and the low landing speed. The three module-type engines are distinguished by a low noise level and complete fuel combustion.

The Yak-42 carries 120 passengers at a cruising speed of 810 kph over distances of up to 2,000 km.

Its simple and easy maintenance and operation enable the plane to be operated from underequipped airfields.

CSO: 1812/79

## MOTOR VEHICLE

### INTERVIEW WITH DEPUTY MINISTER KOLOMNIKOV

Moscow MOSCOW NEWS in English No 31, 9-16 Aug 81 p 4

[Interview with Valentin Kolomnikov, deputy minister of automobile industry in USSR, by Dmitry Sasorov, APN correspondent, date and place not given]

[Text] Valentin KOLOMNIKOV, Deputy Minister of the Automobile Industry of the USSR, was interviewed by APN correspondent Dmitry Sasorov.

**Q.: What cars can we expect to come off the line in the next few years?**

**A.:** All the USSR's automotive enterprises will introduce new models during the current five-year plan. For example, the automobile works in Gorky has already started manufacturing the Volga GAZ-3102, a new model of a medium-sized car. The new VAZ-2105 has come off the line in Togliatti, while another model, the VAZ-2107, will be out before the end of the year.

For the first time, we will be manufacturing cars with front-wheel drive only. They have no cardan shaft going to the rear wheels and, therefore, no shaft tunnel. That will allow us to make the interior roomier and more comfortable. These cars are more stable on the road, especially in slippery conditions. They will be manufactured by the Volzhsky, Moscow and Zaporozhye automobile works.

**Q.: How do various auto-production centres figure in your plans?**

**A.:** The primary role in this will be played by the Kama complex whose annual capacity is 150,000 trucks and 250,000 diesel engines. KamAZ will pro-

vide over 90 per cent of the increase in truck manufacture in the five years. Besides, a plant has been built in Nizhnekamsk, where two models of heavy-duty trucks are being made—the 10-ton KamAZ-5511 for hauling industrial and construction loads, and an auto-train with three-way dumping facilities for agriculture.

The manufacture of auto-trains at the Minsk Plant and of dump-trucks for quarries at the Byelorussian Plant (Zhodino) will increase. There are already 120-ton trucks being made for working in quarries, and a 180-ton model has been tested.

**Q.: Naberezhniye Chelny, Minsk and Zhodino are all cities where diesel-powered trucks are manufactured. So is the idea not only to build heavy-duty trucks but to give priority to diesel vehicles?**

**A.:** Yes, it is. We began introducing diesels a long time ago. Diesel fuel is cheaper and less toxic than gasoline and the engine lasts longer than a gasoline engine.

Production of diesel-powered cars will be increased at the Likhachov Plant in Moscow and at the Uralsky Works. Cars made at the Gorky Works will also have diesel engines in the future. A high-speed diesel bus for international routes has been designed at the Lvov Works.

**Q.: What can you tell us about the recently designed rural truck?**

**A.:** It has a four-wheel drive, far higher road clearance and wide tyres. It will be manufactured at the Kutaisi Works.

The Uralsky Works will be making another specialized vehicle for the oil and gas industry.

**Q.: What measures, if any, are being taken to make the automobile ecologically cleaner?**

**A.:** As well as widely introducing diesel engines, we are also building cars running on liquefied gas which lowers the harmful exhaust fumes by 66 to 75 per cent. During the current five-year period production of automobiles and buses operating on gas will begin on a mass scale.

Another way to keep the air clean is designing an electric car. An experimental group of them is already being tested in Moscow. But this is still only an experiment. There are not yet many electrically driven cars.

But the conventional cars coming off the factory lines are now less toxic thanks to the new Ozon-type carburetors and other modifications in the design. For example, the current automobile now ejects 45 per cent less carbon monoxide into the air than cars built five years ago.



## MOTOR VEHICLE

### KAZAKH HIGHWAYS MINISTER ON MOTOR TRANSPORT OF AGRICULTURAL PRODUCTS

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 17 Jul 81 p 2

[Article by Sh. Bekbulatov, minister of motor highways of the Kazakh SSR: "The Roads to the Elevators"]

[Text] "It is difficult to imagine an efficient agrarian-industrial complex and the modern countryside without a developed road network, suitable transportation, elevators, storage pits, warehouses, refrigerators and packaging facilities. Disorder and a lagging in any of these components is inevitably reflected in the quantity of the final product," Comrade L.I. Brezhnev emphasized at the 26th CPSU Congress.

Guided by these remarks, Kazakhstan's road builders have implemented under the leadership of the party and soviet authorities a number of large-scale measures to expand the volume of road building, particularly in rural localities, improve the technical condition of the existing network of motor highways and upgrade the quality of their repairs and maintenance.

The socialist pledges for 1981 provide for an increase of 2,100 kilometers of motor highways with hard surface, the commissioning of 4,100 linear meters of bridges and the linking of 47 central kolkhoz and sovkhoz estates by hard-surface roads. Work will be performed on evening up the surface over 5,800 kilometers of road, and trees and shrubs will be planted over a distance of 1,525 kilometers.

The annual 2-month construction stints are an important stage in the development of rural trunk roads. This has become a good tradition in Kazakhstan. Their principal task is the high-quality and timely preparation of the road network for the mass shipments of agricultural products of the new harvest.

The working people of Kokchetavskaya Oblast's Ruzayevskiy Rayon were the initiators of the 2-month stints. Their initiative, which was approved by the Kazakhstan Communist Party Central Committee, developed into the construction workers' broad initiative with respect to an improvement in the quality of the main motor highways.

In the period of the 2-month stint this year we have to assimilate more than R124 million of capital investments for the creation of new and repair of old roads. This will enable us to commission 839 kilometers, repair 1,290 kilometers of hard-surface trunk roads, repair 1,691 linear meters of bridges and carry out surface-evening work on the vast majority of roads.

The road builders also adopted a differentiated approach to the times of the 2-month stints: for the southern areas of the republic they began in May-June in order for all the scheduled tasks to have been completed by the start of the harvesting and for the northern areas in June-July.

The bulk of the work had been completed as of the first 10 days of July. Some 73,000 kilometers of road, the main ones of which run from the threshing floors to the elevators, had been made ready for the grain shipments. Road repairs had been completed in Chimbkentskaya, Dzhambul'skaya and Alma-Atinskaya oblasts.

The republic's road builders took special pains over 862 kilometers of approach roads to 425 elevators and grain-acceptance centers. Holes were filled in, the shoulders and inclines were profiled and road signs were installed on them. The majority of the approach roads is in good and excellent condition. At the same time a check has shown that certain roads are being maintained unsatisfactorily. The ministry board drew the attention of departmental organization leaders to the specific shortcomings and charged them with removing them within a week.

Kolkhozes and sovkhozes and enterprises and organizations participate actively in the 2-month stints. This is convincing testimony to the fact that the building of motor highways in the republic is not a narrow sectorial task but a matter of state importance and general concern.

Thanks to the initiative of D. Zhigalkin, first secretary of Dzhambul'skaya Oblast's Dzhuzvalinskiy Raykom, the set quota for the involvement of equipment in road work in accordance with the KASSR Supreme Soviet Presidium Ukase was doubled.

In Alma-Atinskaya Oblast's Talgarskiy Rayon the local staff is headed by Raykom Secretary A.V. Tergeman and Rayispolkom Chairman A.M. Begimbayev. A great deal of work has been done in this rayon on the building of new and the repair of existing roads, and R497,000 have been assimilated against the planned R359,000. A great deal of practical assistance is rendered the road builders by the "Alma-Ata" Kolkhoz, where the chairman is V.I. Smykov, and the Kolkhoz imeni Michurin, which is led by K.A. Abdugulov.

Every year in these periods a considerable amount of road work is performed by the mechanized detachments which are set up in Turgayskaya Oblast's Arkalykskiy and Kiyminski rayons. Particular mention should be made of the specialized brigade of rural machine operators of the "Ishimski" Sovkhoz. Its director, B. Nurtazin, has organized active work the year round.

Very many such examples could be cited. Figures give a clear idea of the scale of this activity. Some 1,833 motor vehicles, 375 tractors, 222 of which being the powerful K-700, and 500 units of other equipment have been enlisted in direct participation in road work. Some 204 mechanized detachments have been created.

The progress of the 2-month stints is regularly examined at ministry board meetings. A recent board meeting observed that making the roads ready for mass grain shipments is only half of the matter. The next stage is maintaining the roads in model technical condition throughout the harvesting period. In this way we will be able to ensure the preservation of the grain and exclude any losses owing to the unsatisfactory state of the carriage way. Attention was drawn to stimulation of the work

of the permanent comprehensive brigades for the current repair and maintenance of the trunk roads to ensure that they constantly monitor the state of the roads and traffic safety and also the drivers' observance of the rules of grain transportation. It was recommended that highway patrol sections be organized with their 24-hour duty watch on the principal train-transporting routes. Stocks of road-building materials and ferroconcrete route-setting components and removable sets of road signs and indicators have been created.

These measures will enable us, where necessary, to carry out repairs and straight-away remove emerging defects and damage to the motor highways rapidly and with high quality.

The board sent to the grain-growing oblasts of the republic ministry executives who, in conjunction with the oblast and rayon staffs, are charged with heading the work locally on the timely shipment of the new harvest.

Comrade L.I. Brezhnev observed at the CPSU Central Committee July (1978) Plenum: "The customer ultimately judges the quality and quantity of the agricultural product by what he sees and can buy in the store. This is why it is necessary to strive for the continuous, coordinated operation of all links of the chain connecting the field or livestock section with the consumer."

And in this chain the motor highways, which are an integral part of the single assembly line of agricultural production, play a most important part. Taking into consideration the fact that with every new day an ever increasing number of Kazakhstan's kolkhozes and sovkhozes will join the harvesting campaign, the republic's road builders are adopting all necessary measures to ensure that the harvest gathered in be delivered to the places of storage on schedule and without loss. "Green Light for the New Harvest"--this motto has become a basic rule in the work of Kazakhstan's road builders.

8850

OSO: 1800/845

## RAILROAD

### INTERVIEW WITH DEPUTY MINISTER OF RAILWAYS KULAYEV

Moscow MOSCOW NEWS in English No 32, 16-23 Aug 81 p 5

[Interview with Konstantin Kulayev, deputy minister of railways to USSR, by Dmitry Sasorov, APN correspondent, date and place not given]

[Text] Konstantin KULAEV, Deputy Minister of Railways of the USSR, said in an interview to Dmitry Sasorov, an APN correspondent:

Soviet railways are responsible today for over a half of the world's freight turnover. The overall length of our railways is not so big—some 142,000 km, that is 11 per cent of the total length of all the tracks in the world—but they work intensely. We have 26,000,000 ton-kilometres of freight and the figure for the USA is 5 times less.

**Q:** Will railways transport retain its leading role in the country's single transport system in the next century, too?

**A:** Of course. At present, the railways carry over two-thirds of all freight and 40 per cent of all passengers in the country. In the next five years freight transportation will grow by 14 per cent and passenger by 10 per cent.

But the railways are working intensively as it is. For example, 160 trains (120 freight and 40 passenger) ride daily on the 1,000 km Omsk-Novosibirsk stretch. The interval of movement there is no more than 5-7 minutes.

**Q:** What, then, is the way out?

**A:** In expanding the railway network. In the current five-year

plan 3,080 km of new tracks will be laid. The 650 km-long Surgut-Urengoi section will be put into operation; traffic will open throughout the length of the Baikal-Amur Railway, and bypath tracks will ease tensions at the Kurgan, Ufa and Rostov-on-Don railway junctions. The Middle Siberian railroad will be made a first-class railway.

However, the main thing in the 11th Five-Year Plan will be the electrification of railways. In the 10th Five-Year Plan we electrified 4,500 km of tracks and in the current five-year period we shall introduce electric haulage on more than 6,000 km. The Kazan route which now puts through 40 trains a day, when electrified, will put through 140 trains. First of all, we plan to electrify the Sverdlovsk Railroad, the most freight-intensive railroad in the world. The Irkutsk-Khabarovsk section will also be completely electrified.

Today 43,000 km of tracks (30 per cent) in the country have been electrified. They are responsible for 55 per cent of total freight turnover, and over 60 per cent of all freight will have been hauled electrically by the end of 1985.

**Q:** What can you say about the future of railway transport development? What new things are expected to appear?

**A:** At present we have 4,000 hp diesel locomotives that are composed of two sections. Soon 9,000 hp 3-section ones will be put into operation. And we are also awaiting new 4-section models.

We also expect 8-axle boxcars. They will be wider, taller and longer. If today a train weighing 4,000 tons can be placed on 850 metres of track where trains are formed, then a train weighing 2,000 tons more can be formed from the new boxcars. But its dimensions will call for the reconstruction of bridges, tunnels and stations.

**Q:** Intervals between trains are very short today. How is safety secured under these conditions?

**A:** This problem is solved in different ways, but the leading role is ascribed to automatic blocking. Today, 86,000 km of track have it and another 15,000 km will be fitted with it during the five-year period.

**Q:** What are the prospects for using high-speed passenger trains?

**A:** This is not a new problem for our time. High-speed trains operate for a long time already in Japan and France, but they travel over special tracks raised on trestles, where conventional trains are not allowed. And our high-speed (200 kph) train travels on the Moscow-Leningrad route on conventional tracks.



## RAILROAD

### CAUSES OF BAM CONSTRUCTION DELAYS NOTED

Moscow GUDOK in Russian 1 Jul 81 p 2

[Article by V. Seseykin: "Speed Up Work: Irkutskaya Obkom Bureau on State of Affairs on the Start-Up Sector of the Western BAM"]

[Text] This year, construction workers are obligated to put the 260-km Lena - Kunerma line into full-time operation. The Northern Baykal division of the new Baykal-Amur railroad already operates here. And getting the maximum return from the start-up complex will depend on how efficiently the numerous subdivisions of transport construction workers, sponsoring organizations and operations personnel work.

During the first five months of this year, assignments were met by only 93.6 percent here. "Mostostroy-9" trust failed to cope with the planned program (18 percent), as did "Armbamstroy" and "Azbamstroy" specialized SMU's [construction-installation administrations] and "Donskoye" SMU. Leaders of "Lenabamstroy" trust, subcontractor and sponsoring organizations have not been able to create a taut labor rhythm in constructing their projects. Terminals are being equipped with electrical dispatching centers slowly at Tayura, Kirenga and Lena-Vostochnaya stations and at Nebel' siding. They have not even begun installing the equipment here. And the norms require that it be installed in not more than four months.

Construction of boiler rooms, waste treatment facilities and unified operating-repair centers is lagging. Start of installation of 40 transformer substations has been delayed. Schedules are not being met for laying water mains, heating lines and sewer lines at Lena, Kunerma and Kirenga stations.

"Zapbamstroymekhanizatsiya" trust is far behind in its vertical leveling at stations and on the route itself.

Nearly 70 percent of the entire start-up complex must be built in the remaining months on the Lena - Kunerma sector. However, the work tempo is still 1.6-fold below what will be required. One and a half times more funds still have to be utilized in each subsequent month. "Lenabamstroy" trust, subcontractor and sponsoring organizations are using labor and material-technical resources far from fully. One reason is the low level of organizational activity at the sites. Another is interruptions in material-technical supply.

The Brigade contract is being introduced slowly. Only a fourth of all brigades have been transferred to this progressive method. The use factor for machinery and equipment is low and we have not changed over to two-shift work.



A serious situation has developed with regard to deliveries of a number of materials and types of equipment. During the first five months of this year, BAM workers failed to receive many hundreds of cubic meters of wall panels and beams, a large number of LEP-10 [transmission line] supports and upwards of 20,000 cubic meters of gravel. There is not enough technological and nonstandard equipment and measuring-monitoring devices, which delays installation subdivision activity. Only slightly more than a quarter of the total equipment, in cost terms, for the start-up complex has been received. Some 33 projects have no delivery schedules at all.

The Ust'-Kutsk client group has not met its obligations. It does not have a full complement of specialists for the signalization, centralization and block system, communications, power and water supplies. The leadership of the Baykal-Amur road (Comrade Lotarev) is tolerant of disruptions in schedules for delivering equipment and has done a poor job of staffing subdivisions with operations personnel. There are also few people in many sponsoring organizations. For example, "Donskoye" SMU has only 170 of the 400 workers it needs.

After analyzing the state of affairs on the sector, the Irkutskaya Obkom bureau noted that installation of the facilities is being managed unsatisfactorily.

The obkom bureau stressed that party committee and site committee of "Lenabamstroy" trust have been unable to mobilize the efforts of construction workers to carry out the year's primary task, putting the sector into full-time operation, and it deems the work of this trust unsatisfactory. Leaders of the "Lenabamstroy" (Comrade Lebed'), "Mostostroy-9" (Comrade Rasskazov), "Zapbamstroymekhanizatsiya" (Comrade Yevtushenko) and a number of sponsoring organizations were warned sharply.

11052

CSO: 1829/338A

## RAILROAD

### PROGRESS, PROBLEMS OF TRANSCAUCASIAN RAIL LINE

#### Engineering Problems

Moscow GUDOK in Russian 26 May 81 p 4

[Article: "An Engineering Solution to a Very Complex Problem"]

[Text] The magnificent mountain chains of the Main Caucasian Range make difficult the transportation ties between the Transcaucasian republics and the Northern Caucasus as well as with other regions of the country. Transcaucasia's railroads are linked with the network's main lines by lines which have been laid along the coasts of the Caspian and the Black Seas in order to avoid the mountain range. Nevertheless, the shortest route lies precisely through this range. Furthermore, the roundabout way lengthens this route by many hundreds of kilometers.

The idea of connecting Transcaucasia's railroads with those of the Northern Caucasus by a main line through an inaccessible mountain range has a century-old history. But now there is every grounds for believing that persons of our generation have the practical ability to implement this project.

Speaking at a ceremonial session in Tbilisi, Comrade L. I. Brezhnev stated the following:

"You have posed the question of building a railroad directly through the Caucasian mountain pass. This idea has been alive for a long time. The difficulties of such a construction project are enormous. But, you know, the lack of such a railroad presents no less difficulties. Surely it is high time to set to work directly on this very complex but also very important economic task."

Our correspondent, S. Ter-Oganesyan, requested the chief of the Kavgioprotrans Institute, /Leonid Levanovich Kvartskhava/[in boldface], to tell us about the Caucasian mountain-pass railroad being planned.

"At various times over the last hundred years several variant plans for building a Caucasian mountain-pass railroad have been worked out. But not one of these plans was carried out. Obviously the time had not yet arrived due to the extraordinary complexity of the layout. But now our institute's group, headed by the chief project engineer, Nikolay Vasil'yevich Svanishvili, has worked out the technical and economic substantiation for building the Caucasian mountain-pass main line. The planners have worked out the possible variants and have selected as the optimal,

shortest layout for the route as passing along the gorges of the Aragvi and Assa Rivers. They calculated the basic parameters for working out the engineering plan: the length of the line, the most important grades, the radii of the curves, the placement of the division points, bridges, tunnels, and other man-made structures.

Included in this work were the scientific staff members of the Georgian Polytechnical Institute imeni V. I. Lenin, the Academy of Sciences of the Georgian SSR, the Tbilisi State University, and other institutes. They made a thorough study of the geological and climatic conditions in the regions where the route will be laid, as well as the type of snow slides and rock slides. The economic problems have been worked out by the Giprotranstei Institute of the Ministry of Railways. After the technical and economic substantiation for the construction has been approved, it will be possible to proceed to the planning.

When the technical and economic substantiation for the construction was reviewed in USSR Gosplan, it was recommended to us that, in view of the route's uniqueness, we perform more detailed work on the mountain-pass section with its large tunnels and complex engineering structures, i. e., in more detail than had been provided in the substantiation, and that we should determine the cost of the construction as a whole. And our group is now working on this.

Of course, the new main line will operate on electric traction, taking into consideration the present-day level of development with respect to construction and operational techniques. For it will absorb the basic freight flow being directed into Georgia and Armenia and will eliminate the circularity of hauls made to avoid the Main Caucasian Mountain Range. The distance of freight hauls proceeding, for example, from the North to Tbilisi will be reduced in comparison with the Black Sea route by 300 kilometers and in comparison with the Caspian route by 900 kilometers. Consequently, car turnover will be speeded up, and there will be a reduction in the costs of hauls.

There where the new main line will pass, the inhabitants of the mountain regions will obtain reliable transport. For in the winter the highways through the passes become impassable. Numerous passengers will also receive a tangible benefit. The time that it takes for trains to go from Moscow to Tbilisi and Yerevan will be reduced by several hours.

In conclusion I would like to say that the Caucasian mountain-pass railroad main line will become a unique monument of glory to the heroism and courage of transport builders and railroad workers at the end of the 20th century.

#### Overall Progress

Moscow GUDOK in Russian 29, 30 May 81, 2 Jun 81

[Article by Ye. Khrakovskiy, engineer: "The Arkhotskiy Variant"; passages enclosed in slantlines printed in boldface]

/Text/ "You have posed the question of building a railroad directly through the Caucasian Mountain Pass. This idea has been around for a long time. The difficulties involved in such a construction project are enormous. But, you know, the lack of such a railroad creates just as many difficulties. Surely it has become high time to set right to work on this very complex engineering but important economic task."

#### 1. An Old Idea

Yes, the idea of laying a steel main line through the Main Caucasian Mountain Range is an old one. It arose more than 100 years ago. In 1872 the question of selecting a direction for a mountain-pass railroad into Transcaucasia. Prior to 1875 possible cuts through the Main Mountain Range between Klukharskiy and Arkhot-skiy Passes were thoroughly studied. During the 1890's Engineer Rydzhevskiy conducted detailed topographical surveys, and under the direction of Professor Inostrantsev geological studies of the route connecting Vladikavkaz (Ordzhonikidze) with Tiflis (Tbilisi) by the shortest distance were carried out. At the end of the last century and the beginning of the present one six complete and four preliminary plans were drawn up for a line through the Caucasian Mountain Range. They were worked out by important Russian scientists and engineers.

At the Giprotranstei Institute they showed me an interesting document, dated 20 May 1914; it was a letter from the Ministry of Railways to the State Duma. The ministry reported that the engineering council had worked out and approved two variant plans for a mountain-pass railroad through the Caucasian Range, and it requested approval of a construction cost earmarked for the railroad amounting to a total of 104,216,132 rubles (what precision!). Moreover, it was pointed out that this calculation had been made without taking into account outlays for electrifying the railroad or the costs of rolling stock, which would cost the treasury another 11 million or more rubles. So that the reader can catch the flavor of this letter, let me cite a brief passage from it here.

/"With regard to these figures, the Ministry of Railways considers it necessary to make the following statements. To foresee at the present time expenditures to equip the Mountain-Pass Railroad with the necessary rolling stock as well as to establish the cost of electrification is extremely difficult. We must not lose sight of the fact that, on the one hand, when the Mountain-Pass Railroad is opened up, it will free up from the total pool a significant amount of rolling stock, which up to this time will have been servicing the circular route through Baladzhari; the latter is approximately four times as long as the route to be covered by the Mountain-Pass Railroad. On the other hand, merely a constant monitoring of the expenditures on water over the course of several years in the sources intended at the present time for obtaining electric power can elucidate in the necessary manner to what degree the Mountain-Pass Railroad will need to be serviced with ordinary rolling stock and within what limits it seems feasible to utilize cheap electric power for train traction."/

And so it was proposed to build special electric power stations to supply electric power to the locomotives. And this would have allowed the making-up of trains--heavy for that period--of 40 double-axle cars and the overcoming of very steep grades and curves with small radii (up to 150 sajenes [ $1 \text{ sajene} = 2.134 \text{ meters}$ ]).



From the very outset the Russian engineers insisted on the double-track variant for this railroad and on laying double tracks in the main tunnel under the Arkhotskiy Pass. They were not disturbed by the fact that in the construction of mountain-pass lines in the Alps recourse was had to simplified plans for purposes of saving money. It was already obvious at that time that short-term economizing would subsequently lead to greater losses in the future. They thought that a second track would be needed within a few decades. In fact, the need arose much earlier. This is what the letter from the ministry to the Duma stated about this matter:

/"The extraordinary advantages of creating new transportation facilities have indeed brought about such extraordinary economic developments which have required second tracks to be laid following the expiration of only brief periods of time. A similar result to an even greater degree must be expected in the case of the Mountain-Pass Railroad through the Main Caucasian Range."/

These words ring true even today. There are still advocates of cutting the construction costs of new railroads. Nevertheless, it is completely clear that in planning such grandiose construction projects we must exhibit a great deal of foresight. Of course, this is a matter of well-founded economic outlays, those which will subsequently pay for themselves a hundredfold.

At times one is simply amazed at how the Russian and Soviet specialists manifested this very foresight; they were able to see and evaluate not only the short-term but also the long-term future. When I became acquainted with the plans for the mountain-pass railroad, I recalled a scientific conference which took place some 20 years ago. They were discussing the prospects for making electric locomotives. And then, in talking about the possibilities of using asynchronous motors in the locomotives, Corresponding Member of the USSR Academy of Sciences A. Alekseyev stated that such motors would be able to develop from 1,000 to 1,500 kW each. Someone inquired: "Why so much power?" Alekseyev replied, without having to pause for thought, "In order to pull trains along the Mountain-Pass Railroad through the Main Caucasian Range."

For us, at that time young engineers, the thought of implementing plans for such a railroad seemed fantastic, and if realizable, then it would be in the far-distant future. But this very gray-haired scientist, one of our greatest electrical engineers, was convinced that this main line must be built during the present century.

What triggered this at that time? Undoubtedly, engineering sense, plus a sober-minded calculation, plus confidence: once there is a need, specific engineering solutions will be found.

The hardest "walnut" to crack in the plan for the mountain-pass line was, of course, the tunnel under the Arkhotskiy Pass, extending in length for 22 versts (1 verst = 1.067 kilometers). Before approving credits for surveying this railroad the committees of the State Duma required that a conclusion be presented by a special conference, with the participation of European authorities on tunneling.

They did not trust their own specialists from their own homeland. And such a conference was held in Vladikavkaz.



The authorities who assembled were indeed major ones. From Switzerland came the director of the technical section of the railroad society of the Bernese Alps, the former chief engineer for the construction of the extremely important Simplon and Lotschberg Tunnels, Zollinger, professor at the Zurich Polytechnical Institute and the former builder of the Albuhl and Tauern Tunnels, Hennings, and the chief construction engineer of the northern section of the Lotschberg Tunnel, Rotpletz. Taking part in the discussion of the plan were Engineer-General Petrov, Academician Chernyshev, and other important Russian specialists. A number of remarks were made. But, on the whole, the conference acknowledged that there were no grounds for doubting the possibility of building a 22-verst tunnel under the Arkhotskiy Pass and that there were no insurmountable difficulties here.

It seemed that construction of the mountain-pass line was just about set to get underway. But World War I began. Life compelled the postponement for many long years of the plan to lay the shortest possible railroad route into Transcaucasia...

During the years of the Soviet regime the extremely important Black Sea line was built; it managed to avoid the Main Caucasian Mountain Range by proceeding along the coast of the Black Sea. As a result the route taken by trains to Georgia and Armenia was greatly shortened, and--most importantly--favorable conditions were created for the rapid development of the country's most important health-resort region. And the previously existing roundabout Caspian Main Line was also considerably reinforced. These projects required large capital investments. And our state made them.

Gradually the traffic capacities of the two roundabout lines became filled up. Now during the summer at the passenger peak load even the freight trains assigned to the southern part of the Black Sea shoreline must be allowed to make round trips between Baku and Tbilisi. The cars roll along for almost a thousand extra kilometers. Because, of course, the freight flow, in connection with the precipitous development of the economies of the Transcaucasian republics, is growing literally with each passing month. The way out of this situation which has been created, the way out which takes the future into consideration, is seen by scientists and planners in the construction of a mountain-pass railroad.

Of course, the engineering solutions of that long-ago plan about which we have spoken have become obsolete. Kavgioprotrans, which has been entrusted with the task of drawing up the technical and economic substantiation for this extremely complex line, examined the following three route variants: the Arkhotskiy (five sub-variants), Kvenamskiy (three sub-variants), and Goriyskiy (three sub-variants). Having utilized modern-day means of surveying, including aerial photography, totaling everything up and weighing all the factors, the planners became convinced that the most preferable was the Arkhotskiy variant--a route which is very close to that which at the beginning of the century had been selected by those remarkable Russian engineers. There it is, engineering intuition! Of course, in the mountains one has to proceed along the rivers and come out to the passes. Here the route is predetermined to a certain degree. Nevertheless, as we have seen, there were quite a few variants and sub-variants. But the Arkhotskiy direction is considered by the specialists even today as the best from the viewpoint of cost and operational indicators, as well as topography of the area. It is also better than the others from the viewpoint of developing the uninhabited mountain regions.

And so Kavgioprotrans marked out a route extending for slightly more than 180 kilometers in length. From the north it will join the double-track line of the North Caucasus Railroad in the region of the Beslan Station, pass through Ordzhonikidze, to the new Tarskaya Station, beyond which it will have to pass through the comparatively small Tarskiy Tunnel. Then the route will pass through the Tarchiy Station and further through the largest Arkhotskiy Tunnel (16 or even 23 kilometers long) and come out on the southern side of the Caucasus Mountain Range. Here there are three more stations. And finally, in the region between Mtskhety and Tbilisi the new line will connect with the Transcaucasian Main Line.

There will be 180 kilometers in all and five new stations. But what an enormous amount of work must be accomplished, what difficulties need to be overcome in order to lay a steel track on this route! We will talk about this in our next report.

[30 May 81 p 4]

## [Text] 2. A Very Complex Engineering Problem

Each of us remembers from childhood the remarkable lines of Pushkin's "Caucasus." But how can we lay steel tracks where "the Aragva dashes along within its misty banks, where the Terek plays in violent merriment"? How can we protect the railroad track from the movement of menacing rock slides, floods, and snow slides? How can we span naked cliffs with viaducts? Where should we drill tunnels through these silent masses of mountains?

Many extremely complex problems had to be solved by the surveyors and planners while matters were still in the stage of working out the technical and economic substantiation (TEO) for laying the mountain-pass line through the Main Caucasian Mountain Range. Frequently unique solutions had to be adopted. At times there were no analogies in Soviet or even in foreign practice. The Caucasus is the Caucasus. The engineers have to treat such a mountain range with great respect. Here is the dry encyclopedia-type information.

The mountain system of the Greater Caucasus extends from the Taman' Peninsula to the Apsheron Peninsula, from the Black Sea to the Caspian Sea. Its length is more than 1,100 kilometers, its width is as much as 180 kilometers, and its elevation extends as high as 5,642 meters (El'brus). The total area of its glaciers is 1,430 sq kilometers.

And it was not by chance that at the end of the last century and in the middle of the present century that the railroad track in Transcaucasia was laid along the shoreline--at first along the Caspian and then along that of the Black Sea. "A smart person will avoid the mountains!" Although, of course, even here extraordinary difficulties had to be overcome. Nevertheless, they can in no way be compared with the complex engineering tasks which must be solved in building a direct line through the Main Caucasian Mountain Range.

The specialists of Kavgioprotrans have been assigned the task of planning this line as an up-to-date double-track electrified main line of the first category. In order that the readers can more vividly conceive what kind of line this will be, let us cite some figures which, to a certain degree, characterize the Arkhotskiy variant of the route. A third of the track (approximately 60 kilometers) must be laid in tunnels, galleries, on support bulkheads, viaducts, large and medium-sized

bridges. About 40 percent of the rails will be laid on curves (the smallest radii will be 300 meters). More than half of the route will be laid at elevations higher than 1,100 meters above sea level. At the entrance to the largest tunnel--that of the Arkhotsk Pass--the line will be perched on a steep slope above the clouds for almost 1.6 kilometers.

The mountain-pass tunnel merits special discussion. It is, if we can so express it, the key project of the entire main line. It is the most expensive and the most labor-consuming. The planners have no doubts that laying it will be the critical section of the overall construction schedule. And, therefore, it will determine the time period required to build the entire line. It has been proposed to drill the tunnel from four faces: two from the side of the portals and two from the side galleries.

It has still not been finally resolved at exactly what elevation the portals will be located. The specialists are still disputing about this. Hence two variant tunnel lengths were cited in the previous report--16 or 23 kilometers. The uninformed person will probably think as follows: why drill through a greater thickness of mountain if a shorter route can be used? All the more so when it is a matter of a key construction project. Every additional meter of tunnel means extra outlays and delays in putting the entire line into operation.

"Yes," V. V. Chepurkin, chief of the Expert Planning and Estimate Administration of the Ministry of Railways, said to me, "many people do not understand or do not want to understand that the longer the tunnel is, the easier will be the approach to it. For, you know, in order to get up to a high elevation, it is necessary to erect viaducts, galleries, support bulkheads, and other structures, none of which are cheap either. And what a great deal of power will have to be expended in order to pull trains up the mountain during the line's operation!"

"I am confident," said Vasilii Vasil'yevich, "that we must build the longer, 23-kilometer tunnel and that it should be double-track from the outset. Of course, let the planners compute everything one more time, but I am convinced: from the viewpoint of the future, it is precisely this variant which is the most effective. In one of the books on the Great Siberian Route I have read that the engineering specifications for laying the Trans-Siberian Main Line were based on the following principle: "Build well and firmly so that subsequently we may add but will not have to rebuild." This is a very fine principle. I think that we should also adhere to it firmly....."

Besides this largest mountain-pass tunnel, another 37 tunnels must be drilled, with a total length of approximately 17 kilometers. Four of them are more than one kilometer long; while the Tarskiy is more than 5.7 kilometers in length.

Tunnels in the mountains not only allow the route to be straighter, they reliably protect the steel rails from rock slides, avalanches, rock wastes, floods, and snow slides. And in places where these threatening natural phenomena are particularly frequent the planners have attempted to provide tunnels. On the Transcaucasian route the length of sections where slides have been observed amounts to 27 kilometers. The total volume of snow borne by them comprises 210,000 cubic meters. So that in open places avalanches and slides do not block the trains from proceeding along the track, we must construct many kilometers of protective galleries against avalanches and slides. And it will not be cheap to protect the



line from floods, And what about the viaducts?!

I had a talk with the chief specialist of the Ciprotranstei, F. S. Shinkarev.

"Usually," he said, "when the conversation touches upon the Transcaucasian Line, people begin to ask about the large tunnels, considering that the greatest difficulties are connected with them both in planning and in construction. But, you know, we have had solid experience in laying tunnels: in subways, on the Krasnodar-Tuapse Line, and, finally, on the BAM [Baykal-Amur Main Line]. Furthermore, the specialists consider that the conditions for laying tunnels here in the center of the Caucasian Mountain Range are more favorable. But we still do not yet have enough experience in erecting railroad viaducts across deep gorges. And it is proposed that about 40 of them be built on the route. The total length of their spans will exceed six kilometers. But the most difficult thing, of course, will be the supports."

F. S. Shinkarev provided a cross-section of the route and pointed out the following:

"Here in this gorge we will have to erect supports as high as a 25-story apartment house. In other places somewhat less, but still extremely impressive dimensions. In some instances the experience gained by highway builders may be of help. But, you yourself understand that a motor vehicle, even the largest truck, is nothing like a train weighing 3,500 tons."

Original solutions were utilized in Yugoslavia during the construction of the new Belgrad--Bar Line. There they built very beautiful viaducts with high supports. It will probably be useful for our transport builders to make a thorough study of this experience. In any case, it is already high time to prepare to build viaducts and other complex, man-made structures for the mountain-pass main line without any postponements.

On a relatively short segment of 180 kilometers, furthermore, in the Caucasus Mountains, where it is hard to develop a broad front, an enormous amount of very complex operations await the transport builders. Let me mention only a few general figures. The volume of rock excavations which will have to be made with the help of contour blasting will exceed four million cubic meters. We will have to lay many dozens of kilometers of 110-kilovolt electric-power transmission lines, build traction sub-stations, construct locomotive depots, points for technical servicing of cars, and many other facilities.

Plans have been made to supply the line with the most up-to-date equipment. In order to control train traffic, provisions have been made for numerical, code-type automatic blocking with dispatcher-control apparatus. All stations will be equipped with electric signalization of switches and signals. It is intended to carry out electrification on industrial-frequency a. c. current.

Of course, in the process of final work on the plan solutions and in preparing working drawings a great deal will have to be refined and certain things even changed. But there is complete confidence that, despite all the difficulties, the direct main line through the Caucasian Mountain Range will be laid. For our party has decided that it is high time that we set to work on this very complex

but important economic task. What kind of role remains to be played by the new main line in the development of the region's economy will be the subject of our concluding report.

[2 Jun 81 p 4]

[Text] 3. Dictated by Economic Necessity

Recently in Rostov I interviewed the chief of the North Caucasus Railroad, F. Kotlyarenko. Remembering our conversation of last year, I was interested in how things were coming along at the junction with the Azerbaijan Railroad. And I received the following answer:

"A bit better. But frequently we still stand still near Akstafa, sometimes we have to leave the trains..."

Last year F. Kotlyarenko had bitterly complained that his neighbors from the south had grabbed the railroad "by the throat." Because they were not being received, trains had stopped in sequence throughout the entire extent for many hundreds of kilometers of the North Caucasus Main Line and even far beyond its boundaries....

The principal difficulties here were created as a result of the fact that the freight flow grew more rapidly than the traffic capacities of the lines had increased. And this disproportion made itself known, and it resulted in enormous losses.

Indeed, the national economy in the republics of Transcaucasia has developed extremely intensively. During the past five-year plan the increase of industrial output in Georgia amounted to 41 percent, in Armenia--46 percent, and in Azerbaijan--47 percent. There has also been a significant increase in the average annual volume of agricultural output. Freight exchange along two lines--the Caspian and Black Sea--grew during the last five years by approximately 10 million tons. But additional transport capacities were not introduced on schedule. And so obstacles arose for trains on the track. Now, thanks to certain measures which have been adopted, the situation has been put into somewhat better order. But will this last long?

It is perfectly reasonable to anticipate the danger that in the not-too-distant future the traffic capacity of lines leading to Transcaucasia will limit the capacity for that region's economic development. This was declared from the rostrum of the 26th Party Congress. A solution was also pointed out--to build a railroad through the Caucasus Mountain Range.

Considerable capital investments are certainly required. And the outlays must be grounded on careful calculations. This is being engaged in right now by Giprotransel's economists, who are working in close contact with the general planners from Kavgioprotrans.

How is the effectiveness of capital investments in building the new railroad line determined? In its most general form, without going into details and refinements, one may explain it in the following manner. Calculations are made as to what construction would cost. Then outlays are determined for a competitive variant. Let's say, directed at strengthening existing parallel lines for another method of delivering freight and passengers. They are calculating the annual savings in



operating expenses as a result of introducing the new construction project. And if the capital investments pay for themselves after a normative period (for new railroads this is accepted as ten years), then the construction is considered to be effective. The earlier the better. The game, as they say, is worth the candle. If it does not pay for itself, then one must expect from the construction project either attempts to find possibilities of making operations less expensive or attaining greater savings in operating expenses.

And how would it be in our case? It is perfectly clear that a railroad through the Main Caucasian Range would be unique not only with respect to the complexity of its engineering solutions and difficulties of the operations themselves but also with regard to cost. Each kilometer here will cost several million rubles. Specifically how much? Of course, it is impossible to estimate exactly to the last ruble, as was written in the letter of the Ministry of Railways to the Duma, which I cited in my first report. The totals which were provided there down to the last ruble were most likely calculated to impress inexperienced officials. In such calculations who can guarantee exactness down to one-tenth-thousandth of a percentage point! Nevertheless, the planners ought to figure out the period of return on investment. With this they were at once entrusted with the task of working out the technical and economic substantiation for this line. They had to make calculations for the tunnels and other complex structures on the level of the engineering plan.

The estimators figured out the capital outlays. But a question arose: what should they be compared with? The TEO was drawn up with expenditures for the appropriate strengthening of existing lines. Double-track inserts are already being laid on the section from Tuapse to Adler. Let's assume even that, despite the very great complexities, second tracks will be successfully laid as far as Sukhumi and further on into Transcaucasia. The number of passenger trains here can be increased in the future. Well, how will it be in the case of freight trains? They are jammed up one after another along tracks located right next to beaches, sanatoriums, and hotels of an enormous resort zone which is not only of all-union but also of international importance. Moreover, the specialists consider that, in general, laying a second track along the Black Sea Line is problematical. The outlays required would be even greater than those for a mountain-pass line.

Neither is it simple to exactly determine future freight and passenger flows. For, of course, it is necessary to look forward for 15 or 20 years. And life, as a rule, introduces very substantial adjustments into the calculations. Let's say that it would have been possible during the 1960's to calculate exactly that in the 10th Five-Year Plan the freight turnover in the region under discussion would increase by 10 million tons. Or that it would have been possible a decade ago to predict that during the past year alone the flow of freight proceeding into Iran across the territory of the USSR would more than double. By the way, the shortest route for such freight would be directly over the Transcaucasian Main Line, then along the new Idzhevan--Razdan Line and to the border.

In general, the economists from the Giprotranstei Institute are solving quite a complex problem with many unknowns. But these are also highly skilled people.

I asked the division chief, A. Chertkov:

"What is the data base for your calculations of freight flows?"

He answered as follows:

"We are carefully analyzing reports for the past two or three five-year plans. We are discovering the developmental trends of the region's economy by means of which the growth of hauls was conditioned. Then we meticulously examine the principal developmental trends in the economies of the adjacent areas for the future; we take into consideration the potentials for expanding production specialization and co-operation, changes in its structure, etc. According to our forecasts, during the next two decades the shipping in and out of freight by railroad to Transcaucasia will sharply increase."

"How accurate is your forecast?"

"I suppose that if we are mistaken, then it is not by too much. We ourselves are very desirous that our calculations be as precise as possible. But in order for this to come about, the Council for the Study of Productive Forces under USSR Gosplan should provide us with future plans for developing Transcaucasia's economy. But so far we have had to calculate and solve everything by ourselves. You yourself must understand that we do not have quite the same possibilities...."

However, even the preliminary estimates of freight and passenger flows for the future provide convincing testimony to the fact that it is impossible to get along without a mountain-pass railroad. This line must be built; there is simply no other solution. I was told this by many specialists with whom I had the opportunity to talk.

"From the viewpoint of operational flexibility the laying down of a new, third connecting main line in this region can in no way be compared with any kind of reinforcing of the two existing lines," one group justifiably declared.

"And how great are the losses and the idle times of rolling stock due to a shortage of transport capacities!" exclaimed another group. "Our scientists have not yet learned how to fully compute the losses from this, but they are very great. It is impossible to let such an over-saturation of transport arteries remain in the future."

"We should also not lose sight of the fact that this line could become a very important link in the international, intercontinental main line, connecting Europe with the Near East. In the future considerable freight flows can be anticipated here," one group expressed its opinion.

"Passengers will gain a great advantage," a fourth group pointed out. "The route from Moscow to Tbilisi and Yerevan will be shortened by more than 280 kilometers. This will reduce the time of the trip by 7--8 hours. And what hours! At present, let's say, Express Train No 13 departs from Moscow at 19:50 and arrives at Tbilisi at 10:04. One must be en route for practically two days and two nights--44 hours and 14 minutes. But what if this time could be cut down to 36 hours? Practically an entire day is gained. And how convenient: you have left Moscow in the evening, and within 24 hours and the next morning you are in Tbilisi...."

Still another important aspect of the problem under discussion was brought out by a person, who, it could be said, is enamored with the future mountain-pass railroad--the chief planning engineer from Kavgioprotrans, N. Svanishvili:

"A considerable portion of the route will pass through regions which, for the greater part of the year, do not have a reliable transport connection. But there are places here which are beautiful, simply splendid. And this railroad will allow us to create an extensive health-resort zone here. I am confident that in the future quite a few sanatoriums, rest homes, camping and mountain-climbing bases will appear here. And the economy of this up-to-now difficult-to-reach territory will be transformed beyond recognition...."

And so, from whatever side you look at it, a direct railroad through the Main Caucasian Range is necessary. Its construction is dictated by economic necessity. And, therefore, we must speed up the planning and preparatory operations in order to more quickly begin to lay this truly unique steel main line.

2384

CSO: 1829/307

## ON EXPANDING USE OF COST ACCOUNTING METHODOLOGY

Moscow ZHELEZNOGOROLZHNYI TRANSPORT in Russian No 6, Jun 81 pp 64-67

[Article by S. A. Nikulin, engineer-economist: "Develop Internal-Production Cost Accounting on a Broader Basis"]

[Text] As outlined by the 26th Congress of the CPSU, the ways to carry out the principal task--the further growth of the Soviet people's prosperity--provide for a more rational utilization of the country's industrial potential, manifold economizing on all types of resources, and an improvement in work quality. Particular attention is being paid to raising labor productivity, increasing the yield of the fixed capital in all sectors of the national economy, and reducing the material consumption of production. As was noted in the accountability report of the CPSU CC to the 26th Party Congress, intensifying the economy, increasing its effectiveness, consists primarily in the fact that, although comparatively less resources are absorbed into production, we can achieve more. Effectiveness should also be the goal of accounting methods and policy in the management field.

In order to further raise production efficiency and work quality in railroad transport during the last few years a number of measures have been implemented with respect to strengthening cost accounting, plan and financial discipline, planning and economic incentives.

An important role in implementing a very strict regime of economizing belongs to internal-production cost accounting, since the end results of the activities not only of individual enterprises but also the network of railroads depend on the careful expenditure of funds at each work place and production section, in each shift and brigade. Skilful handling of the cost accounting of brigades, shifts, and sections permits us to reveal and utilize hidden reserves, facilitates the strengthening of responsibility for a task which has been entrusted, and creates a motivation for the workers to increase their effectiveness and work quality. All the activity of the cost-accounting sections is subordinate to the over-all tasks of the enterprise's work, as determined by the state plan. The effectiveness and validity of internal-production cost accounting is determined, to a large extent, by the completeness of implementing its principles. Organizing cost accounting in sectorial line enterprises is impossible without the presence of the necessary normative base of labor and material outlays or improving technical and economic as well as operational-production planning. Of great importance here is specifying the set of approved and design indicators of cost-accounting activity for each sub-division and their close coordination with the enterprise's indicators. Experience has shown that the number of plan indicators and cost-accounting measuring rods should be



minimal but sufficient for an objective appraisal of the work of brigades, shifts, and production sections. Moreover, assignments and norms ought to be established with respect to those types of operations and outlays on which the group of the sub-division can exert an influence.

Further perfecting internal-production cost accounting requires a substantial improvement in setting norms for all production resources, a systematic review of obsolete norms and the introduction of progressive ones, appropriate to a contemporary level of equipment, technology, organization of production and labor. Moreover, there must be an intensification of the mobilizing role of the technically well-grounded norms in strengthening cost accounting and in implementing a system of effecting economies.

Of great importance for increasing production efficiency is the economical and careful utilization of labor resources. One reserve is the further dissemination of the experience of the Shchekino Chemical Combine in railroad transport, taking into consideration the characteristics of the sector and the existing practice of introducing it on a number of railroad divisions.

As is known, the principal goal of the Shchekino method is to raise labor productivity and increase production output with a lower number of personnel and a broad-based application of one of the most important principles of cost accounting--the material motivation of workers to broaden the areas of service, combine occupations, and increase the volume of work being performed. Close, reciprocal ties between internal-production cost accounting as a means of implementing a system of effecting economies in the expenditure of resources and the Shchekino method, directed at raising labor productivity, based on the economical and most effective use of labor resources, predetermines their comprehensive utilization.

It should be noted that the effectiveness of introducing the Shchekino method will depend, to a large extent, on the level of organizing internal-production cost accounting, a high quality of planning, a normative base of labor, material, and financial outlays, as well as a system of awarding bonuses. Furthermore, the comprehensive application of cost accounting and the Shchekino method in sectorial and line enterprises will exert a significant influence on improving the end results of the activity of railroad transport enterprises. These positions are affirmed by the conditions of applying the Shchekino method, when improving the labor organization, material incentives, and planning provides an increase in labor productivity, while at the same time ensuring the rational expenditure of resources.

An extremely important task while working in accordance with the Shchekino method is economizing on the wage funds, by means of which bonus payments and other forms of material incentives for workers ought to be carried out. Observance of a very strict system of effecting economies in the expenditure of funds is facilitated by the transfer at the end of the year of the unused savings in the wage fund to the material-incentive fund. The decree of the CPSU CC and the USSR Council of Ministers, "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Raising the Effectiveness of Production and Improving Work Quality," has opened up great possibilities for perfecting the Shchekino method and for the growth of labor productivity. At the same time, in order to increase the responsibility of the enterprises for the economical expenditure of the wage fund, provisions have been made so that the over-expenditure of the fund allowed to them in a



given current year are made up by means of the material-incentive fund within the limits of the total amount of the transferred unused savings of the wage fund for the previous year.

At the present time the evaluation of the sources of the production-financial activity of enterprises, as well as their economic incentives, are carried out on the basis of qualitative indicators. The indicator of the growth in labor productivity is the over-all fund-forming indicator for all levels of administering the basic operational activity in railroad transport.

The introduction of the Shchekino method at railroad transport enterprises provides additional incentives to increase it. Moreover, it is necessary that the incentive-fund system be directed at creating material motivation for the groups at branch enterprises, divisions, and railroads to raise their labor productivity by means of combining occupations, expanding the areas of service, and increasing the volume of the work being performed. It is appropriate to remark here that the improvement of internal-production cost accounting of enterprises' sub-divisions is impossible without closely linking it with socialist competition and material incentives, since the combination of these two extremely important factors facilitates the achievement of the best end results of operations with the least outlays of labor, material, and financial resources.

It is a known fact that internal-production cost accounting allows the integration of various forms of labor payment and bonuses into a unified, flexible system of material incentives for the growth of labor productivity, the effective utilization of fixed production assets, particularly rolling stock, savings on raw materials and other materials, an increase in output quality, operations, and services. Therefore, further improvement of the material-incentive system ought to be aimed at intensifying the influence of bonuses on the effectiveness of production and increasing labor productivity, as well as speeding up the introduction of the achievements of science and technology, the scientific organization of labor and advanced production experience, and the improvement of the qualitative indicators of the use of rolling stock.

The correct application of bonus systems allows us to objectively evaluate the contribution made by labor groups to the achievement of high end results. It should be noted, however, that material incentives have still not everywhere been made directly dependent on the effectiveness and quality of the workers' labor; at a number of enterprises bonuses have been made into mechanical additions to wages. In this connection particular importance attaches to the economic grounds for bonus payments, the elimination of extras, and the liquidation of elements of "leveling off" in the practice of awarding bonuses.

The efficiency yield of material incentives grows substantially when the latter are closely tied in with moral encouragement and socialist competition. However, the unity of moral and material incentives depends on the carrying out of organizational and educational work within the groups. It is well known that internal-production cost accounting, by creating among the workers a concerned motivation with regard to the end results of their labor, increases responsibility for the status of production as a whole and for the work being turned out, facilitates carefulness in the expenditure of public funds, and arouses the workers to take an active part in production administration. In this connection, it is necessary to achieve a

situation whereby each worker master the economy of his own production section, learns to count the working minutes, material and financial outlays, and struggle against slipshod management and losses.

Expansion of the sphere of applying internal-production cost accounting depends, to a great extent, on the rational organization of labor, as well as on the mid-level manager--the foreman, who is the organizer of production and the teacher of the workers in the section headed up by him. He has been entrusted with the large and responsible tasks of guaranteeing the performance of the plan assignments with a high degree of quality within the allotted time period, the observance of a system of effecting economies in the expenditure of funds, the development of socialist competition, the introduction of progressive labor methods, etc. In this connection, in order to increase the role of the foreman as a direct supervisor, it is necessary to increase his material motivation to improve the results of the work of the sections. This will certainly facilitate the improvement of the hauling process, the development of internal-production cost accounting, and the strengthening of personnel staffs.

It must be noted that in most railroad enterprises internal-production cost accounting has become the basic form of management. Thus, at locomotive depots 89 percent of the sub-divisions organize their own activities on the principles of internal-production cost accounting, track intervals--by 87.8 percent, mechanized intervals engaged in freight-handling operations--by 85.4 percent, intervals with civil-engineering facilities--by 85 percent, and railroad-car depots--by 82 percent.

We must place particular emphasis on the need to expand the sphere of applying and raising the effectiveness of internal-production cost accounting in car-maintenance enterprises, which account for almost 1/6 of the contingent of workers, 1/5 of the fixed capital and operating expenditures of the railroads, and more than 40 percent of the outlays for materials. Though it has quite a high level of development with respect to internal-production cost accounting at car-maintenance enterprises, the network is still not paying sufficient attention to expanding the sphere of its application in the structural sub-divisions of car depots on the Azerbaijan, North Caucasus, Transcaucasian, Central Asian, and other railroads.

Uninterrupted growth in the volume of hauls, a speed-up in the delivery of freight and passengers, as well as increased operational efficiency of the railroads, depend, to a large degree, on the technical equipment of car maintenance and the organization of labor. Here a large role is played by the system which has been adopted for financing repairs on several types of freight cars by factual outlays.

In order to further improve cost accounting, the Ministry of Railways has made the decision to transfer to planning and financing outlays to the depot repair of freight cars of all types in accordance with plan costs approved individually for each car pool in determining the ratio of the number of cars to the increased and normal volume of repairs. It has been proposed that the financing of car depots for an actually fulfilled program of repairs be carried out in accordance with two variants.

According to Variant I the financing of expenditures for the depot repair of freight cars would be conducted under conditions of an increase in the relative

proportion of cars with an increased volume of repairs in comparison with those taken into account in the plan costs as adjusted to the plan costs, which accord consideration to additional outlays for repairs on the increased volume as compared to the normal amount, and in the remaining cases--according to the plan costs.

In accordance with Variant II the financing of expenditures for the depot repair of freight cars will be conducted under conditions of a change in the relative proportion of the cars with an increased volume of repairs as compared with those taken into account in the plan costs as adjusted to the plan costs, as determined by the increase or decrease of the plan costs for the increase or decrease (in points) in the relative proportion of cars with an increased volume of repairs.

Adjustment of the plan costs will be carried out in accordance with the following formulas:

$$C_{pl}^K = C_{pl} [1 + K (\alpha_{\phi} - \alpha_{pl})] \quad \text{Variant I;}$$

$$C_{pl}^K = C_{pl} [1 + (\alpha_{\phi} - \alpha_{pl})] \quad \text{Variant II,}$$

where  $C_{pl}^K$  is the adjusted plan cost of the depot repair of cars;

$C_{pl}$  is the plan cost of repairs;

$\alpha_{\phi}$  is the proportion of cars with increased volume of repairs within the total number of repaired cars during the reporting period for a specific type of cars;

$\alpha_{pl}$  is the proportion of cars with an increased volume of repairs, taken into consideration in the plan cost;

$K$  is the coefficient reflecting the excess of the repair costs for an increased volume over the repair costs for a normal volume.

The following values have been adopted as the coefficient for four-axle cars: for tank cars 0.1, for boxcars and flatcars 0.2, and for gondola cars 0.3. The chiefs of the railroads have been accorded the right to establish even higher values for this coefficient, taking into consideration the operating characteristics of individual car depots. The right to expenditures in accordance with Article 169, entitled "Depot Repair of Freight Cars," in accordance with these two variants is determined by multiplying the adjusted plan cost of repairing each type of cars by the actual number of repaired cars. The calculation of the adjusted plan cost is presented every month by the car depots to the division simultaneously with the accounts for financing.

To our way of thinking, in comparing the two variants for financing the depot repairs of freight cars, Variant II is the more acceptable, since it creates a specific economic motivation for the depot to increase the number of repaired cars with an increase in the volume of repairs. To a considerable extent, this will facilitate improvement of the car pool, maintaining it in a suitable technical condition, capable of meeting the safety requirements of train traffic.

The conversion to the new system of planning and financing outlays for the depot repair of freight cars will create the necessary conditions for the further



improvement of internal-production cost accounting at depots, and, above all, will ensure the identity of a depot's planning indicators and its structural sub-divisions, along with better grounds for planning and summarizing the results of production-financing activity.

Of great importance in organizing internal-production cost accounting is the determination of the plan indicators and the cost-accounting criteria. Thus, at the Krasnoarmeysk Car Depot of the Donetsk Railroad the following plan indicators have been established for the cost-accounting sections: for a PTO /technical-service (inspection) point/ with various types of activities--the number of freight cars passed through the PTO, prepared while still loaded, and cars undergoing maintenance and repairs while uncoupled; the assembly shop--the number of cars repaired at the depot; the shop for repairing automatic-braking equipment--air distributors and other parts repaired; wheel and roller-bearing shops--repaired wheel pairs and roller-bearing pairs; woodworking shop--processed wooden materials; auxiliary-preparation shop--number of repaired automatic-coupling caps, trap-door covers, door flaps; forging and machine shop--production output as expressed in cost.

At the Krasnyy Liman Depot the number of plan indicators has been increased for certain shops. Thus, in order to determine the volume of work for an automatic-control point an amount, expressed in monetary terms, has been established for repaired air distributors of various types, terminal and disconnecting faucets, safety valves, brake-cylinder pistons, automatic regulators, as well as manufactured spare parts; the wheel and roller-bearing shop--repair of sliding wheel pairs, intermediate inspection of roller-bearing wheel pairs, full inspection of wheel pairs; auxiliary-preparation shop--repair and casting of bearings, checking out springs, soaking of polsters and shafts, repair of babbit-metal casting, parts, and the making of spare parts (in rubles), the collection and shipping out of scrap metal (in tons); wood-finishing shop--making boards of various thicknesses (in cubic meters). It should be noted that the plans of the production sub-divisions of the Krasnyy Liman Car Depot provide for the utilization of production waste-products. Thus, the wood-finishing shop has been assigned the task of processing and gluing together boards made from old and new wastes, while the auxiliary-preparation shop is responsible for repairing items made with nuts and bolts. It would be feasible to establish such indicators for other car depots as well, but with consideration being given to local conditions.

The production-financial plan of cost-accounting sections is worked out, as a rule, for a quarterly period with a breakdown by months; it includes indicators of the volume of work and expenditures, as well as technical-economic indicators and norms. For example, at the Krasnoarmeysk Car Depot for the internal-production subdivisions the expenditures plan establishes outlays for wages, materials, and spare parts, as well as general expenses for all branches of accounting, but the Krasnyy Liman Depot, besides these indicators, also establishes plan production costs. In some car depots for cost-accounting sections expenditures are not planned for fuel and electric power (except for general business needs), and, as a rule, expenditures are not planned for the amortization of fixed capital assets.

Car-maintenance enterprises are conducting work along lines of the rational utilization of material resources. At a number of car depots, for example, workers have been awarded bonuses for economizing on lumber materials and spare parts. This form of material incentives is being widely adopted in car depots of the West

Siberian, Kemerovo, and Lvov Railroads. At the Perovo Car Depot of the Moscow Railroad a great deal of attention is being paid to providing material incentives to workers for over-fulfilling their assigned tasks with regard to labor productivity. Here, under conditions of ensuring a high quality of repairs and car inspections, more than 50 percent of the workers are being awarded bonuses. As a result, a growth in labor productivity is observed, as well as a decrease in the amount of defective output, while profitability has been achieved in all structural subdivisions.

Deserving of widespread dissemination is the awarding of bonuses to workers for the smooth output of cars from repair work: it is necessary to pay out bonuses in increased amounts for the smooth (by ten-day periods) release of cars from repairs and to reduce such bonuses if this smoothness is not observed.

At the L'vov-Passazhirskiy, Kleparov, Zdolbunov, and Chernovtsy Car Depots of the L'vov Railroad a comprehensive system of quality control has been extensively developed, under which the awarding of bonuses to workers and engineering-technical employees of the production sections is carried out, taking into consideration the quality coefficient, also taking into account the growth in labor productivity, the increase in efficiency and work quality, turning over output upon the first presentation, the smoothness of releasing cars from repairs, and the status of labor discipline. Thus, if a bonus is established for workers for fulfilling a car-repair plan in the amount of 20 percent, then taking the quality coefficient into consideration, it could in one case be raised to 40 percent, and, in another case, be reduced or not paid out at all. Such incentives have exerted a substantial influence on improving the quality of car repairs.

An effective means of providing material and moral incentives to car-maintenance workers is the awarding to the most outstanding workers the titles "Car Repairman-Inspector First-Class," or "Car Conductor First-Class" with the payment of a monthly bonus amounting to 15 rubles. The awarding of these titles motivates workers to increase the effectiveness of production and labor productivity, to improve the work qualitative indicators, and to improve their skills; it also strengthens labor and production discipline. However, these titles should be awarded taking into consideration business qualities, experience, and results achieved on the job.

Of great importance for increasing production effectiveness and work quality, along with a growth in labor productivity, is the awarding of bonuses to workers who have particularly distinguished themselves in carrying out plan tasks and socialist pledges, from a fund which has been set aside at the disposal of the foreman of a production section. As is known, at car-maintenance enterprises the right to form this fund has been granted to foremen and senior foremen of production sections of car depots, washing and steaming points, railroad car-wheel workshops, and car sections. It seems feasible to permit the formation of a foreman's fund at all subdivisions of car-maintenance enterprises--PTO's, conductors' reserves, offices engaged in servicing passengers, as well as increasing the scope of contributions to this fund up to 5 percent of the plan wage fund of a production section.

Of great importance for further improving internal-production cost accounting at car-maintenance enterprises is the ensuring of an objective evaluation of the achievements of the groups of the enterprises' subdivisions in fulfilling the plan assignments and socialist pledges. The most widespread method used for



evaluating the results of the cost-accounting sections' production-financial activities is comparing the actual volumes of work and the achieved level of qualitative indicators with the plan assignments, norms, and standards, and in part of the expenditures--comparing the actual outlays with those of the plan, as calculated for the fulfilled volume of operations, and determining the savings or the overexpenditure of resources. For example, at the Krasnoarmeysk Car Depot three methods are employed for determining the right to expenditures: for the PTO--by means of adjusting the plan outlays, taking into consideration the percentage of the dependent outlays on the fulfilled volume of work; for the repair and manufacturing workshops --by multiplying the actually fulfilled volume of work by all the types of output, a review of which is conducted with a change in production technology, prices by materials and spare parts, etc.; for the assembly shop specializing in the depot repair of gondola cars,--by actual outlays.

Many car depots practice relating to the financial results of the cost-accounting sections the sums of material responsibility for various production lacunae. Thus, the system of mutual material responsibility at the Orel Depot of the Moscow Railroad has been a good recommendation for itself. It must be emphasized, however, that the introduction of this system requires a meticulous working out of a practical mechanism for applying claims, taking into account the tasks confronting the groups of the depot internal-production subdivisions.

At car-maintenance enterprises widespread use is being made of a system of point evaluation of the results of the work of cost-accounting sections. A qualitatively new form of point system is the system being used in the car depots of the Lvov Railroad for evaluating the results of the production-financial activity of all the enterprises' sub-divisions by a quality coefficient, which is a generalizing indicator, characterizing the effectiveness of the work of individual employees and personnel groups of brigades, shifts, and sections. Correlating the size of bonuses with the size of the quality coefficient allows a manifold evaluation to be made of the labor of every performer, along with his contribution to the over-all results.

In the 11th Five-Year Plan railroad transport has been assigned responsible tasks with respect to the complete and on-time satisfaction of the requirements of the national economy for hauls, reducing the time periods for delivering goods, ensuring their preservation, raising the standards of passenger service. The successful fulfillment of the tasks of the 11th Five-Year Plan will depend, to a large extent, on inculcating an economical attitude among all railroad workers to the public good. In the first place, we must concentrate our efforts on speeding up the growth of labor productivity, improving the quality of output, economizing on raw and other materials, fuel, and electric power, and a better use of fixed capital assets.

The broad-based development of cost accounting as the principal method for conducting maintenance operations, its close interrelationship with socialist competition will facilitate the successful completion of the tasks which were assigned to railroad transport by the 26th Congress of the CPSU.

COPYRIGHT: Izdatel'stvo "Transport", "Zheleznodorozhnyy transport", 1981

2384

CSO: 1829/321

## OCEAN AND RIVER

### PROGRESS, PROBLEMS IN TRANSPORTING GRAIN

Moscow VODNIY TRANSPORT in Russian 8 Aug 81 p 1

[Article by V. Yeliseyev]

[Text] Early in the morning when the city on the Neva River is still sleeping, the Volga motor ship "Volgo-Don-125" approached the specialized pier of the Leningrad Grain Products Combine imeni S. M. Kirov. It was delivering 4,500 tons of wheat from the new harvest to Leningrad. Mooring, preparation for unloading and taking grain samples occupied approximately one hour of the total time and the captain of the motor ship I. Mel'nikov wrote in the logbook: "0500. Began unloading."

And how did this grain voyage begin. Loading at Yeysk occupied 36 hours and the motor ship then set off on its voyage. The Volgo-Don Canal imeni V. I. Lenin was traversed without interference and without delays. The traffic schedule was well organized. They reached Gor'kiy 19-20 hours ahead of time. The crew worked so as to keep ahead of the schedule all the time and this was achieved up to a specific moment.

The Volga workers understood that time is now busier since the faster they deliver the grain to Leningrad the more quickly they return to the Don for the next consignment of wheat. But idle times of the ship began through no fault of the crew, which very rapidly "ate up" almost all the advance schedule.

As recorded in the ship's log, they stood idle at Cheboksary for 4 hours 40 minutes waiting clearance through the lock and they were idle at Balakhna another 5 hours and 10 minutes. And the forced anchorage at Gorodetsk continued from 1400 to 2020 and the ship was held not only by low water, but by a personnel question--they were immediately short two crew members.

They say that misfortune does not come singly. Seemingly on purpose, there were breakdowns in the machinery twice during the voyage. It was difficult to inspect them at anchorage before departing on the voyage. One cannot help but take into account that both the ship and its engines began to count off the second decade of operation on the country's rivers last year.

The first time the water pump of one of the main engines failed and the second time the cylinder cover was replaced. In order not to get behind the traffic schedule,

all repair work in the engine room was carried out while under way. They were travelling during this time on one engine. Of course, they were moving at slower speed but still they were moving forward rather than standing still.

All motormen not on watch worked in the engine room during this time. Their labor was no for nothing. As a result they arrived at Leningrad 15 hours ahead of schedule. Engineer-second navigator Vladimir Derin and helmsman-motorman Sergey Maslov especially distinguished themselves in repair of the machinery.

This is how the first grain voyage proceeded.

As they reported in the fleet shipment and traffic service of the Northwestern Shipping Line, unloading of the motor ship "Volgo-Don-125" was completed early in the morning on the next day. The established unloading norm was maintained. This provides the basis to assume that those seven ships which now are already under way with grain from the new harvest to Leningrad will also be handled on time without above-norm idle times.

And now the "Volgo-Don-125," having taken on board construction panels, has departed on its voyage. When this return cargo is turned over, the motor ship will again take on grain from the new harvest into its holds. It will take on 4,500 tons of harvested wheat.

[Article by A. Aleksandrov]

[Text] Preparations for massive grain shipments have been completed at the river ports of Kuybyshevskaya Oblast. The river workers are greeting the grain from the new harvest fully armed. Checking of the transloading equipment on the docks of the elevators and milling enterprises has already been completed. Their equipment has been tested in operation. The first 10 motor ships to deliver wheat were unloaded on the dock of Kuybyshev Milling Plant No. 2. Almost all of them were handled and departed on their voyage ahead of schedule.

[TASS article]

[Text] The river workers of the Volgo-Don Shipping Line have given the green light to the new harvest. A total of 150,000 tons of shipped grain is the sum of the first phase of their shock watch during the current harvest season.

One can feel the pulse of the harvest season especially clearly in the control room of the shipping line. Glancing at the large schedule-chart, one can easily imagine the scales of organized operations. Almost 400 ships with displacement from 60 to 5,000 tons are engaged in delivery of wheat, barley and millet on the Don, Severskiy Donetsk and Manycha Rivers and the Seas of Azov and Tsimlyansk.

A total of 1.5 million tons of grain from the Don, Kuban', Stavropol' and Volgo-gradskaya and Voronezhskaya Oblasts will travel through the river transport conveyor this season.

The continuous work of the river workers is well supported: the entire fleet has been repaired, the approaches to the elevators have been treated and the water basin of the piers has been deepened. The ports inspected the stations for checking the quality of shipment and handling of cargo even before the harvest season. Innovations were introduced at their suggestion. The dock workers of Rostov and Volgodonsk now load grain onto the ships in any weather, even in strong winds and rain. Special devices that tightly close the hatches of the holds will assist them.

The river workers and port collectives have concluded an agreement of cooperation with the grain product administration, truck drivers and railway workers. An operational group has been created to coordinate the actions of the fleet and other types of transport. The decisions adopted by them acquire the force of law. And now you can hear the brief instructions of the dispatchers:

"Motor ship GT-300, take a course toward Konstantinovsk--grain has accumulated there. Rostov-Tovarnyy station, an empty car is needed."

The collective of the Volgo-Don Shipping Line is sending the ships to transport grain upon the first signal of the customers.

6521

CSO: 1829/326



## MISCELLANEOUS

### AIRCRAFT ENGINES USED IN GROUND TRANSPORTATION

Moscow VOZDUSHNYY TRANSPORT in Russian 1 Aug 81 p 3

[Article: "The Aircraft Engine Changes Jobs"]

[Text] A display, "Surface Use of the Aircraft Engine in the National Economy," has been opened at the VDNKh SSSR [USSR Exhibition of Achievements of the National Economy]. This is already the fourth such exhibit set up by the pavilion "USSR Transport".

Our correspondent Yu. Shvarev asked pavilion director N. Kucherenko to tell about the exhibits of this display.

"In the first place, these exhibits are widely popularizing the use of aircraft engines on the ground. And this, in my opinion, is very important. For previously, most engines that had served their time in the air went to the metallurgical presses. Definite progress has now been made in the use of this costly equipment. Already the use of aircraft engines on the ground has enabled 2 billion rubles to be saved during a five-year period.

"The demand for aircraft engines that have worked out their service life is constantly growing, and they are being used increasingly widely in the national economy. Our display tells about it.

"Actually, the sphere of use of aircraft engines is extraordinarily wide. For example, in railroad transport it is used to clean railroad cars of freight that has frozen. Experience in such work already exists at the Mikhaylovka Mining and Concentrating Combine of the Kursk Magnetic Anomaly. Represented at the display are special machines with aircraft engines for cleaning VPP's [runways] of snow and ice. The machines are also used widely to clean the higher parts of aircraft of icing. All this will greatly help an airport to operate normally in the most complicated weather and aircraft to complete their runs on time and safely.

"More than 50 percent of aircraft engines used on the ground involve power plants. The advantage here is the fact that the engine is small but generates a great deal of power. Engines from Il-18 airplanes are used more often than others, these engines being taken for ground work after ordinary preventive repair. That is, they are 'requalified' without large capital expense.

"A mobile gas-turbine power set for the combined generation of electricity and heat is interesting. This installation is used as a base TETs in various branches

of the national economy. It has already been introduced in remote regions of Magadanskaya, Sakhalinskaya and Tyumenskaya Oblasts. The economic benefit from introducing just one of these engines is about 800,000 rubles per year.

"The scope of the display is wide and diverse. Represented here, for instance, are a quarry fan for removing dust and gases from the work area and an installation for removing gases from underground mines. It yields about 560,000 rubles per year in benefit. As the developers consider, this installation has a great future. The TG-20 heat generator for preheating motor-vehicle engines, even in the Far North environment, enables the starter motors of 50 trucks to be preheated simultaneously. The aircraft engines are used in their new role also in the south of our country, particularly where the irrigation grid has been developed. At the order of the land reclaimers, VNIISTROYDORMASH [All-Union Scientific-Research Institute for Construction and Road Machinery] developed a canal cleaner that uses an aircraft engine. The fact is that during each irrigation season the irrigation canals are 50-percent filled with silt. Previously, silt was cleared from the canals manually, or by bulldozers, which greatly damaged the concrete walls and bottoms of the canals. A machine with two aircraft engines and a telescoping nozzle enables up to 200 cubic meters of silt to be removed per hour. The production of this machine, which passed tests successfully in Moldavia, has been planned since last year. The economic benefit from using each such unit will be 20,000 rubles per year.

"The 'Bars' launch, on an air cushion, stimulates great interest. Its 'heart' is a Ka-26 helicopter engine that has used up its service life. The launch can be used both as a cargo and a passenger craft; geologists and medical personnel can use it. The 'Bars' was intended for operation in localities where travel is difficult, where other types of transport, except for helicopters, are weak. Strictly speaking, it is difficult to call the 'Bars' simply a launch. For it can move easily and rapidly over water, ice, snow, swamps and the tundra (at a speed of 80-90 kilometers per hour). Even rushes 1½ meters high do not frighten it.

"It is difficult to even enumerate all the displays of the exhibit. And in each of them the aircraft engine that has spent its service life has found its second life and has begun to bring benefit on the ground."

11409

CSO: 1829/344

END

**END OF**

**FICHE**

**DATE FILMED**

*Sept. 29, 1981*

---

~~XXXXXXXXXX~~